

JetBox User Manual—How to use Sparklan WPER-150GN wifi

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Support Models

JetBox9560/9460 series (JetOS95 v1.3 or above version)

Note: JetOS is Korenix embedded Linux OS.

Introduction



SparkLAN Wireless USB Half Mini Card, WPER-150GN, based on Ralink's RT3070 chipset, fully supports the features and functional compliance with IEEE 802.11 b/g standard, supporting up to 150Mbps data rates. Comparing to 802.11g technology, it makes big improvement on speed and range.

This document describes how to enable support for WiFi devices based on the Ralink chipsets on JetBox devices.

description	
interface	ra0
Driver Name	RT2870
Driver file	rt3070sta.ko
Config files	/etc/Wireless/RT2870STA/RT2870STA.dat
Start file	/etc/init.d/net.ra0
Default	down

RT2870 driver can be configured via following interfaces,
i.e. (i)"iwconfig" command, (ii)"iwpriv" command, (iii) configuration file

Configure Wifi with “iwconfig” tool

1. Connect AP without encryption

```
# iwconfig ra0 essid "ap-name"
```

2. Connect AP with WEP encryption

```
# iwconfig ra0 key [1] 0123456789
# iwconfig ra0 key open
# iwconfig ra0 essid "ap-name"
# udhcpc -i ra0
```

Configure Wifi with “iwpriv” tool

Usage 1: iwpriv ra0 set [parameters]=[val]

Note: Execute one iwpriv/set command simultaneously.

1. Config STA link with AP which is OPEN/NONE(Authentication/Encryption)

```
# iwpriv ra0 set NetworkType=Infra
# iwpriv ra0 set AuthMode=OPEN
# iwpriv ra0 set EncrypType=NONE
# iwpriv ra0 set SSID="AP's SSID"
```

2. Config STA to link with AP and OPEN/WEP(Authentication/Encryption)

```
Default Key ID = 3
# iwconfig ra0 key [3]
# iwconfig ra0 key s:abcde
```

```
# iwconfig ra0 essid "AP's SSID"
```

3. Config STA to link with AP which is SHARED/WEP(Authentication/Encryption)

```
# iwpriv ra0 set NetworkType=Infra  
# iwpriv ra0 set AuthMode=SHARED  
# iwpriv ra0 set EncrypType=WEP  
# iwpriv ra0 set Key1="AP's wep key"  
# iwpriv ra0 set DefaultKeyID=1  
# iwpriv ra0 set SSID="AP's SSID"
```

4. Config STA to link with AP which is WPAPSK/TKIP(Authentication/Encryption)

```
# iwpriv ra0 set NetworkType=Infra  
# iwpriv ra0 set AuthMode=WPAPSK  
# iwpriv ra0 set EncrypType=TKIP  
# iwpriv ra0 set SSID="AP's SSID"  
# iwpriv ra0 set WPAPSK="12345678"  
# iwpriv ra0 set SSID="AP's SSID"
```

ps. Step 4 is part of generating wpapsk password and is necessary.

5. Config STA to link with AP which is WPAPSK/AES(Authentication/Encryption)

```
# iwconfig ra0 mode managed  
# iwpriv ra0 auth 3  
# iwpriv ra0 enc 4  
# iwconfig ra0 essid "AP's SSID"  
# iwpriv ra0 wpapsk 12345678  
# iwconfig ra0 essid "AP's SSID"
```

6. Config STA to link with AP which is WPA2PSK/TKIP(Authentication/Encryption)

```
# iwpriv ra0 set NetworkType=Infra  
# iwpriv ra0 set AuthMode=WPA2PSK  
# iwpriv ra0 set EncrypType=TKIP  
# iwpriv ra0 set SSID="AP's SSID"  
# iwpriv ra0 set WPAPSK="12345678"  
# iwpriv ra0 set SSID="AP's SSID"
```

7. Config STA to create/link as adhoc mode, which is OPEN/NONE(Authentication/Encryption)

```
# iwpriv ra0 set NetworkType=Adhoc
```

```
# iwpriv ra0 set AuthMode=OPEN
# iwpriv ra0 set EncrypType=NONE
# iwpriv ra0 set SSID="Adhoc's SSID"
```

8. Config STA to create/link as adhoc mode, which is WPANONE/TKIP(Authentication/Encryption)

```
# iwpriv ra0 set NetworkType=Adhoc
# iwpriv ra0 set AuthMode=WPANONE
# iwpriv ra0 set EncrypType=TKIP
# iwpriv ra0 set SSID="AP's SSID"
# iwpriv ra0 set WPA2PSK=12345678
# iwpriv ra0 set SSID="AP's SSID"
```

9. Get site survey

```
# iwpriv ra0 get_site_survey
```

10. Link with any AP without security

```
# iwconfig ra0 essid ""
# iwpriv ra0 set SSID=""
```

Configure Wifi by modifying configuration file “RT2870STA.dat”

The configuration file /etc/Wireless/RT2870STA/RT2870STA.dat is the equivalent to the Windows "ini" file format, with a number of variable = value pairs.

Use "vi RT2870STA.dat" to modify settings according to your need.

- 1.) Set NetworkType to "Adhoc" for using Adhoc-mode, otherwise using Infrastructure
- 2.) Set Channel to "0" for auto-select on Infrastructure mode
- 3.) Set SSID for connecting to your Accss-point.
- 4.) AuthMode can be "WEPAUTO", "OPEN", "SHARED", "WPAPSK", "WPA2PSK", "WPANONE"
- 5.) EncrypType can be "NONE", "WEP", "TKIP", "AES"

For more information refer to the Reference.

Here is a sample configuration file:

#The word of "Default" must not be removed

```
Default
CountryRegion=5
CountryRegionABand=7
CountryCode=
ChannelGeography=1
SSID=11n-AP
NetworkType=Infra
WirelessMode=5
Channel=0
BeaconPeriod=100
TxPower=100
BGProtection=0
TxPreamble=0
RTSThreshold=2347
FragThreshold=2346
TxBurst=1
PktAggregate=0
WmmCapable=1
AckPolicy=0;0;0;0
AuthMode=OPEN
EncrypType=NONE
WPAPSK=
DefaultKeyID=1
Key1Type=0
Key1Str=11n-AP-key
Key2Type=0
Key2Str=
Key3Type=0
Key3Str=
Key4Type=0
Key4Str=
PSMode=CAM
AutoRoaming=0
RoamThreshold=70
APSDCapable=0
APSDAC=0;0;0;0
HT_RDG=1
HT_EXTCHA=0
...
```

Turning the wireless interface on

```
# ifconfig ra0 up
```

The necessary driver should be automatically loaded. If necessary, it can be manually loaded via:

```
# modprobe rt3070sta
```

Check the wireless interface with “iwconfig ra0”

```
[root@JetBox 9500 MB init.d]# iwconfig ra0
ra0      Ralink STA  ESSID:"KorenixAP2"  Nickname:"RT2870STA"
        Mode:Managed  Frequency=2.447 GHz  Access Point: 00:90:4C:60:04:00
        Bit Rate=54 Mb/s
        RTS thr:off   Fragment thr:off
        Encryption key: XXXXXXXXXX
        Link Quality=88/100  Signal level:-57 dBm  Noise level:-83 dBm
        Rx invalid nwid:0  Rx invalid crypt:0  Rx invalid frag:0
        Tx excessive retries:0  Invalid misc:0  Missed beacon:0
```

Putting it all together

Edit the /etc/init.d/net.ra0 and replace with your own Wireless configuration:

```
#!/bin/sh
#
# A Sample Configuration for Connect AP with WEP encryption

echo "Starting Wireless ..."
ifconfig ra0 up
iwconfig ra0 key [1] 0123456789
iwconfig ra0 key open
iwconfig ra0 essid "KorenixAP"
udhcpc -R -n -p /var/run/udhcpc.ra0.pid -i ra0
```

Start the Wireless Interface with System

Add a link for the adapter in /etc/rc3.d/

```
# ln -sf /etc/init.d/net.ra0 /etc/rc3.d/S41Wireless
```

References:

- <http://wiki.debian.org/rt2860sta>
- <http://shmichen.blogspot.com/2010/12/commands-for-wireless-tool-and.html>

Syntax is 'Param'='Value' and describes below.

name	value
CountryRegion	0: use 1 ~ 11 Channel 1: use 1 ~ 13 Channel

name	value
	2: use 10 ~ 11 Channel 3: use 10 ~ 13 Channel 4: use 14 Channel 5: use 1 ~ 14 Channel 6: use 3 ~ 9 Channel 7: use 5 ~ 13 Channel 31: use 1 ~ 14 Channel (ch1-11:active scan, ch12-14 passive scan)
CountryRegionAB and	0: use 36, 40, 44, 48, 52, 56, 60, 64, 149, 153, 157, 161, 165 Channel 1: use 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140 Channel 2: use 36, 40, 44, 48, 52, 56, 60, 64 Channel 3: use 52, 56, 60, 64, 149, 153, 157, 161 Channel 4: use 149, 153, 157, 161, 165 Channel 5: use 149, 153, 157, 161 Channel 6: use 36, 40, 44, 48 Channel 7: use 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 149, 153, 157, 161, 165 Channel 8: use 52, 56, 60, 64 Channel 9: use 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 132, 136, 140, 149, 153, 157, 161, 165 Channel 10: use 36, 40, 44, 48, 149, 153, 157, 161, 165 Channel 11: use 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 149, 153, 157, 161 Channel
CountryCode	AG, AR, AW, AU, AT, BS, BB, BM, BR, BE, BG, CA, KY, CL, CN, CO, CR, CY, CZ, DK, DO, EC, SV, FI, FR, DE, GR, GU, GT, HT, HN, HK, HU, IS, IN, ID, IE, IL, IT, JP, JO, LV, LI, LT, LU, MY, MT, MA, MX, NL, NZ, NO, PE, PT, PL, RO, RU, SA, CS, SG, SK, SI, ZA, KR, ES, SE, CH, TW, TR, GB, UA, AE, US, VE "" => using default setting: 2.4 G - ch 1~11; 5G - ch 52~64, 100~140, 149~165
SSID	0~z, 1~32 ascii characters.
WirelessMode	0: legacy 11b/g mixed 1: legacy 11B only

name	value
	2: legacy 11A only //Not support in RflicType=1(id=RFIC_5225) and RflicType=2(id=RFIC_5325) 3: legacy 11a/b/g mixed //Not support in RflicType=1(id=RFIC_5225) and RflicType=2(id=RFIC_5325) 4: legacy 11G only 5: 11ABGN mixed 6: 11N only 7: 11GN mixed 8: 11AN mixed 9: 11BGN mixed 10: 11AGN mixed
Channel	depends on CountryRegion or CountryRegionABand
BGProtection	0:Preamble Long 1:Preamble Short 2:Auto
RTSThreshold	1~2347
FragThreshold	256~2346
TxBurst	0: Disable 1: Enable
NetworkType	Infra: infrastructure mode Adhoc: adhoc mode
AuthMode	OPEN For open system SHARED For shared key system WEPAUTO Auto switch between OPEN and SHARED WPAPSK For WPA pre-shared key (Infra) WPA2PSK For WPA2 pre-shared key (Infra) WPANONE For WPA pre-shared key (Adhoc) WPA Use WPA-Supplicant WPA2 Use WPA-Supplicant
EncryptType	NONE For AuthMode=OPEN WEP For AuthMode=OPEN or AuthMode=SHARED TKIP For AuthMode=WPAPSK or WPA2PSK AES For AuthMode=WPAPSK or WPA2PSK
DefaultKeyID	1~4
Key1	10 or 26 hexadecimal characters eg: 012345678
Key2	5 or 13 ascii characters eg: passwd

name	value	
Key3	(usage : "iwpriv" only)	
Key4		
Key1Type	0	hexadecimal type
Key2Type	1	assic type
Key3Type	(usage : reading profile only)	
Key4Type		
Key1Str	10 or 26 characters (key type=0)	
Key2Str	5 or 13 characters (key type=1)	
Key3Str	(usage : reading profile only)	
Key4Str		
WPAPSK	8~63 ASCII	or 64 HEX characters
WmmCapable	0: Disable WMM 1: Enable WMM	
PSMode	CAM	Constantly Awake Mode
	Max_PSP	Max Power Savings
	Fast_PSP	Power Save Mode
FastRoaming	0	Disabled
	1	Enabled
RoamThreshold	Positive Interger(dBm)	
HT_RDG	0	Disabled
	1	Enabled
HT_EXTCHA	Extended Channel Switch Announcement	
	0	Below
	1	Above
HT_OpMode	0	HT mixed format
	1	HT greenfield format
HT_MpduDensity	based on 802.11n D2.0 0: no restriction 1: 1/4 μ s 2: 1/2 μ s 3: 1 μ s 4: 2 μ s 5: 4 μ s 6: 8 μ s 7: 16 μ s	

name		value
HT_BW	0	20MHz
	1	40MHz
HT_AutoBA	0	Disabled
	1	Enabled
HT_BADecline	0	Disabled
	1	Enabled <Reject BA request from AP>
HT_AMSDU	0	Disabled
	1	Enabled
HT_BAWinSize	1 ~ 64	
HT_GI	0	long GI
	1	short GI
HT_MCS	0 ~ 15	
	33: auto	
HT_MIMOPSMODE	0	Static SM Power Save Mode
	1	Dynamic SM Power Save Mode
	2	Reserved
	3	SM enabled
	(not fully support yet)	
EthConvertMode	dongle	
	clone	
	hybrid	
EthCloneMac	XX:XX:XX:XX:XX:XX	
IEEE80211H	0	Disabled
	1	Enabled
TGnWifiTest	0	Disabled
	1	Enabled
WirelessEvent	0	Disabled
	1	Enabled <send custom wireless event>
MeshId	Length 1~32 ascii characters	
MeshAutoLink	0	Disabled
	1	Enabled
MeshAuthMode	OPEN	For open system
	WPANONE	For WPA pre-shared key (Adhoc)
MeshEncryptType	NONE	For MeshAuthMode=OPEN
	WEP	For MeshAuthMode=OPEN
	TKIP	For MeshAuthMode=WPANONE

name	value	
	AES	For MeshAuthMode=WPANONE
MeshWPAKEY	8~63 ASCII or 64 HEX characters	
MeshDefaultkey	1~4	
MeshWEPKEY	10 or 26 characters	
	5 or 13 characters	
CarrierDetect	0	Disabled
	1	Enabled